

### **REMARKS**

After the foregoing amendment, claims 1 and 4-11, as amended, are pending in the application. Claims 1 and 7 have been amended to more particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 2 and 3 have been canceled. Claims 9-11 are new. Applicants submit that no new matter has been added to the application by the Amendment.

### **Interview**

Applicants wish to thank the Examiner for the courtesy of the interview conducted on September 13, 2004 in which Applicants' attorney of record explained the previously provided Proposed Amendment to claim 1. Applicants agree with the Interview Summary.

### **The Present Invention**

The preferred embodiment of the present invention is directed to a reproducing apparatus that reproduces information from a signal read from a storage medium. The apparatus includes first and second waveform equalizers. The first equalizer is used for extracting information from the read signal. The second equalizer is used exclusively for extracting a read clock signal from the read signal.

In extracting the read clock signal from the read signal, the read signal should be subject to a type of equalization that minimizes jitter of the resultant read clock signal. In generating the read clock signal, if a transition of the read signal corresponding to the shortest mark goes undetected, the edge of the read signal cannot be located, thus increasing the jitter considerably. In the worst case, a bit slip may occur. In order to minimize the likelihood of missing a transition corresponding to the shortest mark, the signal corresponding to the shortest mark should have an amplitude great enough to be sliced or digitized. Accordingly, the second equalizer has an equalization characteristic that emphasizes the high frequency components of the read signal.

Conversely, extracting the information from the read signal does not require emphasizing high frequency components of the read signal to such a degree that every transition of the signal is completely identifiable. Thus, the waveform equalizer for extracting the clock signal has an equalization characteristic which emphasizes high frequency characteristics of the

read signal more strongly than does the equalization characteristic of the equalizer used for extracting the information from the read signal. Advantageously, such an arrangement leads to a lower error rate of the decoded read signal than an alternative arrangement.

### **Objections to the Drawings**

The Examiner objected to Figs. 4, 8 and 9 because they are not labeled "Prior Art". Applicants have attached an Appendix to this Amendment, including a replacement sheets for Figs. 8 and 9 showing the addition of the legend "PRIOR ART" for the Examiner's approval. Fig. 4 however, relates to the first embodiment of the invention and is referenced at paragraph 0035 on page 11 and paragraph 0058 on page 18. Consequently, Applicants respectfully submit that the legend "PRIOR ART" is inapplicable to Fig. 4. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the objections to the Figs 4, 8 and 9.

### **Rejection - 35 U.S.C. § 102**

The Examiner rejected claims 1-4 and 6-8 under 35 U.S.C. § 102 as being unpatentable over U.S. Patent No. 5,596,559 (Hiramatsu).

The Examiner is of the position that Hiramatsu discloses a first waveform equalizer which equalizes a read signal corresponding to the information read out from the storage medium, thereby outputting a first equalized signal; and a second waveform equalizer, which has an equalization characteristic different from that of the first waveform equalizer, outputs a second equalized signal and is selectively used to extract a read clock signal. The Examiner further states that Hiramatsu discloses a second waveform equalizer having an equalizer characteristic which emphasizes high frequency characteristics of the input signal more strongly than the first waveform equalizer does.

Claim 1 has been amended with the limitations of claim 3 to recite, an apparatus for reproducing information comprising a first a first waveform equalizer which equalizes a read signal and a second waveform equalizer used to extract a read clock signal for application to a phase locked loop, in which the equalization characteristic of the second waveform equalizer emphasizes high frequency components of the input signal more strongly than does the equalization characteristic of the first waveform equalizer.

Hiramatsu discloses, in Figs. 10-14 and at column 5 line 56 to column 6, line 52,

an information reproducing apparatus having an equalizer 12 for data detection (corresponding to the first equalizer) and an equalizer 13 for PLL control (corresponding to the second equalizer). The equalizer 12 for data detection has the equalization characteristic as shown in Fig. 14 and the equalizer 13 for PLL control has the equalization characteristic as shown in Fig. 12. Figs 12 and 14 clearly show that the frequency characteristic of an output signal from the equalizer 13 for PLL control has a lower high frequency intensity than the frequency characteristic of an output signal from the equalizer 12 for data detection.

The equalization characteristics of the equalizer 12 and the equalizer 13 are quite different from those of the first and second equalizers of the present invention. Specifically, the relationship of frequency characteristics of the first and second equalizers is opposite to the frequency characteristic relationship of the first and second equalizers recited in amended claim 1. Applicants submit that amended claim 1 is not anticipated by Hiramatsu. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 102 rejection of claim 1.

Further, it is respectfully submitted that since amended claim 1 has been shown to be allowable, claims 4 and 6-8, dependent on amended claim 1, are allowable, at least by their dependency. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 102 rejection of claims 4 and 6-8.

### **Rejection - 35 U.S.C. § 103**

The Examiner rejected claim 5 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,596,559 (Hiramatsu) in view of admitted prior art.

The Examiner is of the position that Hiramatsu discloses all the limitations of claim 5 except for expressly disclosing an A/D converter and a phase control signal generator. The Examiner states, however, that the aforementioned features are disclosed by admitted prior art.

The admitted prior art identified by the Examiner discloses the claimed A/D converter and the claimed phase control signal generator. However, the admitted prior art does not teach or suggest first and second equalizers where the second waveform equalizer emphasizes high frequency components of the input signal more strongly than does the equalization characteristic of the first waveform equalizer, as recited in amended claim 1.

Claim 5 is dependent on claim 1. The admitted prior art of the present invention cannot cure Hiramatsu's opposite teaching. Applicants submit that claim 5, dependent on claim 1, is not

obvious over Hiramatsu in view of the admitted prior art. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claim 5.

#### **New Claims 9-11**

New claim 9, dependent on amended claim 1, recites that the equalization level of the first waveform equalizer is smaller than the equalization level of the second waveform equalizer. New claim 9 is supported at paragraph 0047 of the specification.

New claim 10, dependent on amended claim 1, recites that the apparatus includes a first equalization characteristic controller that performs feedback control over the first waveform equalizer. New claim 10 finds support at Fig. 10 and paragraph 0082.

New claim 11, dependent on amended claim 1, recites that the apparatus includes a second equalization characteristic controller that performs feedback control over the second waveform equalizer. New claim 11 finds support at Fig. 10 and paragraphs 0082 and 0087.

Hiramatsu does not teach or suggest: (1) making the equalization level of the first equalizer smaller than the equalization level of the second equalizer, or (2) including either a first or a second equalization level controller.

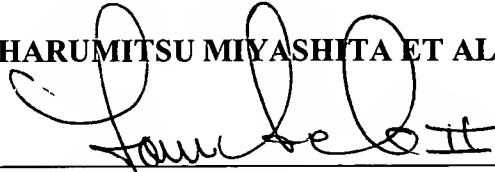
Further, it is respectfully submitted that since amended claim 1 has been shown to be allowable, new claims 9-11, dependent on amended claim 1, are allowable, at least by their dependency. Accordingly, Applicants respectfully request allowance of new claims 9-11.

**Conclusion**

Insofar as the Examiner's objections and rejections have been fully addressed, the instant application, including claims 1 and 4-11, is in condition for allowance and Notice of Allowability of claims 1 and 4-8 is therefore earnestly solicited.

Respectfully submitted,

**HARUMITSU MIYASHITA ET AL.**



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